Coronary CT angiography as a guide in decision-making for left main spontaneous coronary dissection

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A 36-year-old woman presented to the emergency department with sudden-onset chest pain. Her medical history included an atrial septal defect closure with percutaneous device due to relapsing transient ischemic attacks (TIAs) 7 years prior. A few minutes after presentation, she suffered in-hospital cardiac arrest with ventricular fibrillation as underlying rhythm. After successful defibrillation, the electrocardiogram showed ST segment elevation in anterior leads. The patient underwent emergent invasive coronary angiography under dual antiplatelet therapy and heparin, which revealed spontaneous coronary dissection of the left main artery extending to the middle segment of the left anterior descending artery (LAD) (Fig. 1, panel A).

The patient was treated conservatively, and her hospitalization was uneventful. She was discharged under treatment with aspirin, clopidogrel, and beta-blocker. She was scheduled for follow-up coronary CT angiography (CCTA) one month after the event, as intubation of coronary ostium and contrast injection during subsequent invasive coronary angiography could potentially lead to further expansion of the dissection.

At presentation one month later, the patient was free of symptoms. CCTA revealed an extensive hematoma at the left main stem, which significantly compromised the true lumen. The dissection flap was visible at the level of left main bifurcation (Fig. 1, panel B and C). There was no argument for dissection extending to left anterior descending artery. All three coronary arteries showed no other signs of stenosis.

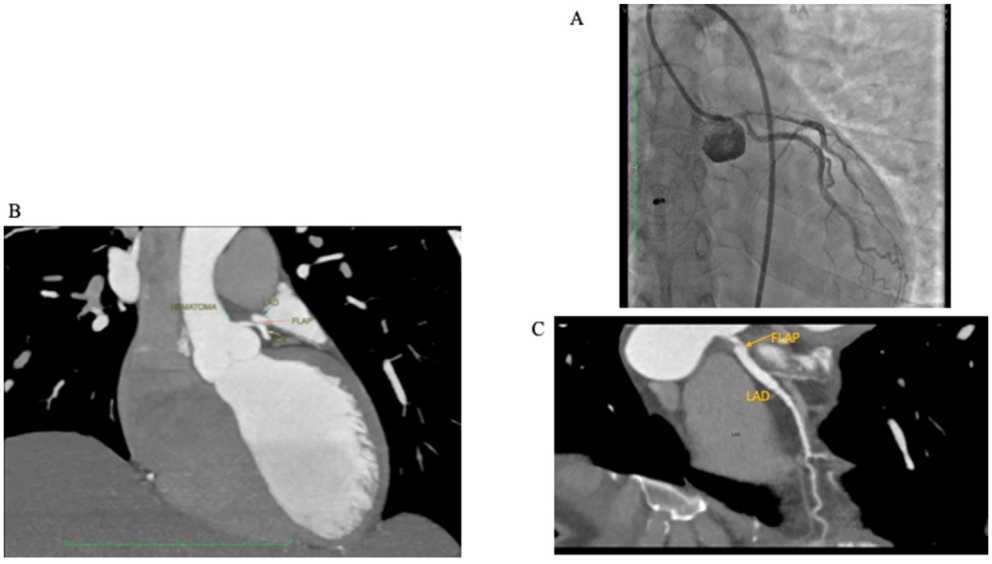

Fig. 1. Panel A: Invasive coronary angiography, revealing left main dissection, extending to the middle LAD; **Panel B:** First CCTA multiplanar reconstruction (MPR) image of LM and bifurcation, showing the intramural hematoma and the dissection flap; **Panel C**: Curved MPR image of LAD clearly showing the dissection flap.

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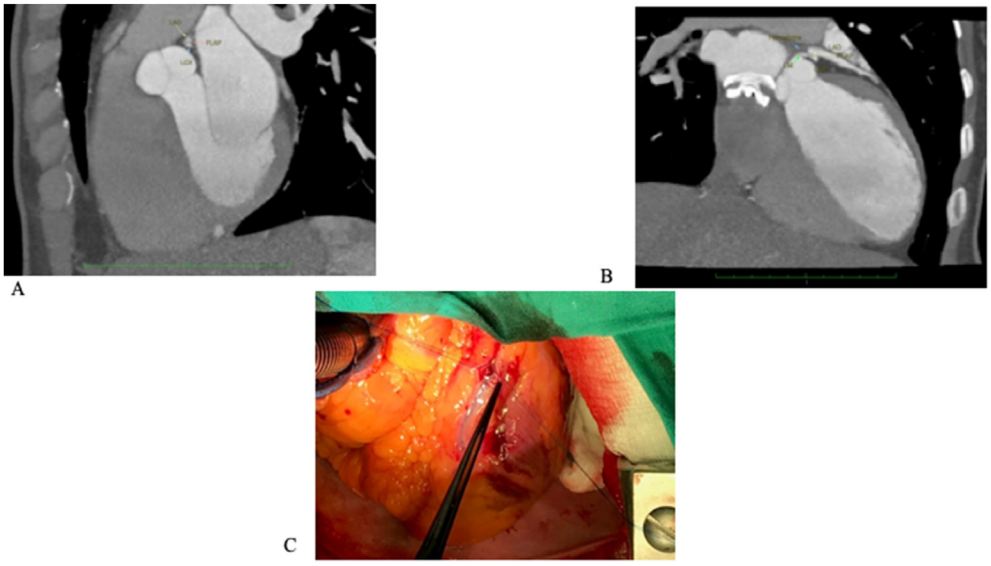

Fig. 2. Panel A: Second CCTA short axis MPR image at the bifurcation level, showing the dissection flap; **Panel B**: Second CCTA long axis MPR image showing the persisting hematoma and the dissection flap; **Panel C**: Intraoperative image presenting intraluminal LAD thrombus proximal to the arteriotomy.

As the patient remained asymptomatic, it was decided after careful consideration to have her undergo a second CCTA two months after the index event. Unfortunately, the second CCTA revealed similar results, with significantly compromised left main lumen due to persisting hematoma and a dissection flap at the level of bifurcation (Fig. 2, panel A and B).

Lastly, taking into consideration the data of the two CCTAs, the Heart Team recommended a surgical revascularization. Indeed, the patient underwent coronary artery bypass surgery two and a half months after the index event. Both left and right internal mammary arteries (LIMA and RIMA) were harvested. LAD arteriotomy was performed before the bifurcation to the first diagonal branch. The dissection with superimposing thrombus (2 cm, Fig. 2, panel C) was visible proximally, and the thrombus was removed appropriately. The true LAD lumen was identified, and RIMA-LAD anastomosis was completed successfully with a prolene 7-0 suture. Obtuse marginalis 1 (OM1) showed no signs of dissection, and LIMA was successfully anastomosed with a prolene-7 suture. The post-operative course was uneventful, and the patient was discharged on the sixth post-operative day.

CCTA is a valuable tool for noninvasive angiographic follow-up of patients with spontaneous dissection.[1-3] Although conservative management is mostly proposed, data on appropriate management of stabilized and further asymptomatic patients with left main dissection remain extremely scarce. In the present case, serial imaging with CCTA contributed significantly in decision making.

Disclosures

There is no conflict of interest to disclose for any author.

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